WHAT IS CLAIMED IS:

1.   A non-linear digital video editing system, comprising:

(a) a computer system, including one or more monitors, operator input devices, and data storage devices, wherein digitized source material is stored on the data storage devices and displayed on the monitors in response to operator commands received via the input devices; and

(b) video editing software, executed by the computer system, for editing the digitized source material to create a sequence of one or more output frames, wherein the video editing software displays one or more timelines on the monitor, each timeline contains one or more tracks that separate, layer, and sequence sources, including video, audio, graphics and digital video effects sources, an operator places one or more events on one or more of the tracks in order to create the output frames, and one or more of the events comprise one or more nested sources.

2.   The non-linear digital video-editing system of claim 1, wherein a time scale indicates whether portions of the sources are rendered.

3.   The non-linear digital video-editing system of claim 1, wherein each of the nested sources comprise a sub-timeline.

4.   The non-linear digital video-editing system of claim 1, wherein the video editing software creates a nested source by selecting one or more portions of a timeline.

5.   The non-linear digital video-editing system of claim 1, wherein the video editing software represents the nested source as a single event on a single track that is edited to a timeline.

6.   A non-linear digital video editing system, comprising:

(a) a computer system, including one or more monitors, operator input devices, and data storage devices, wherein digitized source material is stored on the data storage devices and displayed on the monitors in response to operator commands received via the input devices; and

(b) video editing software, executed by the computer system, for editing the digitized source material to create a sequence of one or more output frames, wherein the video editing software displays one or more timelines on the monitor, each timeline contains one or more tracks that separate, layer, and sequence sources, including video, audio, graphics and digital video effects sources, an operator places one or more events on one or more of the tracks in order to create the output frames, and the video editing software performs vertical compositing by blending one or more layers of sources, one on top of the other, in one or more of the tracks.

7.   The non-linear digital video-editing system of claim 6, wherein each track of a timeline acts as a separate layer, and any empty or muted tracks are transparent, showing through to the tracks beneath.

8.   The non-linear digital video-editing system of claim 6, wherein black sources are invisible, so that an underlying track is visible therethrough.

9.   The non-linear digital video-editing system of claim 6, wherein the video editing software applies a time warp icon to a track to adjust a speed of a video source residing on the track.

10.   The non-linear digital video-editing system of claim 6, wherein the video editing software includes automatic alpha keyed graphics, such that one or more graphic sources are stacked on one or more tracks and then automatically keyed through the tracks.

11.   The non-linear digital video-editing system of claim 6, wherein the video editing software imports one or more animations with traveling mattes onto one or more tracks, and automatically keys the mattes out.

5   12.   A non-linear digital video editing system, comprising:

(a) a computer system, including one or more monitors, operator input devices, and data storage devices, wherein digitized source material is stored on the data storage devices and displayed on the monitors in response to operator commands received via the input devices; and

10   (b) video editing software, executed by the computer system, for editing the digitized source material to create a sequence of one or more output frames, wherein the video editing software displays one or more timelines on the monitor, each timeline contains one or more tracks that separate, layer, and sequence sources, including video, audio, graphics and digital video effects sources, an operator places one or more events on one or more of the tracks in

15   order to create the output frames, and the video editing software synchronizes one or more video and audio sources, selects the synchronized video and audio sources, and then creates a sync source from the selected video and audio sources.

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13. A non-linear digital video editing system, comprising:

(a) a computer system, including one or more monitors, operator input devices, and data storage devices, wherein digitized source material is stored on the data storage devices and displayed on the monitors in response to operator commands received via the input

5 devices; and

(b) video editing software, executed by the computer system, for editing the digitized source material to create a sequence of one or more output frames, wherein the video editing software displays one or more timelines on the monitor, each timeline contains one or more tracks that separate, layer, and sequence sources, including video, audio, graphics and digital

10 video effects sources, an operator places one or more events on one or more of the tracks in order to create the output frames, and the video editing software includes a multi-cam feature for simultaneously viewing and editing multiple synced sources, wherein each source has its own corresponding camera assignment.

15 14. A non-linear digital video editing system, comprising:

(a) a computer system, including one or more monitors, operator input devices, and data storage devices, wherein digitized source material is stored on the data storage devices and displayed on the monitors in response to operator commands received via the input devices; and

20 (b) video editing software, executed by the computer system, for editing the digitized source material to create a sequence of one or more output frames, wherein the video editing software displays one or more timelines on the monitor, each timeline contains one or more tracks that separate, layer, and sequence sources, including video, audio, graphics and digital video effects sources, an operator places one or more events on one or more of the tracks in

25 order to create the output frames, and the video editing software uses a media export function to output in one or more streaming formats for publishing the output frames to a network.

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15.   A method for serialization of compositing instructions in a non-linear video editing system, comprising:

(a) generating a tree of compositing operations comprised of a plurality of nodes, wherein each of the nodes comprises a compositing operation;

(b) breaking up the compositing operations into one or more streaming headers, wherein the streaming headers match resources available on a hardware device that performs rendering operations;

(c) recursing the tree of compositing operations to generate pairs of streaming headers, wherein the pairs of streaming headers comprise a packet;

(d) reducing a time required for rendering by examining each pair of streaming headers that is generated from a recursion of the tree ;

16.   The method for serialization of claim 15, wherein the reducing step comprises merging a pair of streaming headers into a single header.

17.   The method for serialization of claim 15, wherein the reducing step comprises generating a new compositing operation for a pair of streaming headers.

18.   The method for serialization of claim 15, wherein the streaming header contains data pointers which reference video and graphic data.

19.   The method for serialization of claim 15, wherein the streaming header is divided into a section containing actual hardware parameters needed during execution, and a section containing information about the video and graphic material required for the header.

20. A method for invalidating cached hierarchically composited images, comprising:

(a) serializing a compositing tree for a particular image that needs to be loaded into the cache, into an ordered packet of streaming headers;

(b) performing a hashing function on the packet to create a hash value;

(c) inserting an image entry into the cache according to the hash value;

(d) detecting one or more cache hits by comparing the hash values of a given header packet with the hash values in the cache; and

(e) invalidating the cache at a coarse grain level by examining each item stored in the cache, when a clip is modified.

21. A method for color space conversion and luma keying, comprising:

(a) selecting a line of an image;

(b) selecting a pixel of the selected line;

(c) generating a luminance component of the selected pixel;

(d) clamping the generated luminance component;

(e) resizing the clamped luminance component;

(f) performing a luminance key on the resized luminance component.